ANNEX 12 - PERSISTENT TOXIC SUBSTANCES

1. **Definitions**. As used in this Annex:
   (a) "Persistent toxic substance" means any toxic substance with a half-life in water of greater than eight weeks;
   (b) "Half-life" means the time required for the concentration of a substance to diminish to one-half of its original value in a lake or water body;
   (c) "Early warning system" means a procedure to anticipate future environmental contaminants (i.e., substances having an adverse effect on human health or the environment) and to set priorities for environmental research, monitoring and regulatory action.
2. **General Principles**.
   (a) Regulatory strategies for controlling or preventing the input of persistent toxic substances to the Great Lakes System shall be adopted in accordance with the following principles:
      (i) The intent of programs specified in this Annex is to virtually eliminate the input of persistent toxic substances in order to protect human health and to ensure the continued health and productivity of living aquatic resources and human use thereof;
      (ii) The philosophy adopted for control of inputs of persistent toxic substances shall be zero discharge; and
      (iii) *The reduction in the generation of contaminants, particularly persistent toxic substances, either through the reduction of the total volume or quantity of waste or through the reduction of the toxicity of waste, or both, shall, wherever possible, be encouraged.*
   (b) The Parties shall take all reasonable and practical measures to rehabilitate those portions of the Great Lakes System adversely affected by persistent toxic substances.
3. **Programs**. The Parties in cooperation with the State and Provincial Governments, shall develop and adopt the following programs and measures for the elimination of discharges of persistent toxic substances:
   (a) Identification of raw materials, processes, products, by-products, waste sources and emissions involving persistent toxic substances, and quantitative data on the substances, together with recommendations on handling, use and disposition. Every effort shall be made to complete this inventory by January, 1982;
   (b) Establishment of close coordination between air, water and solid waste programs in order to assess the total input of toxic substances to the Great Lakes System and to define comprehensive, integrated controls;
   (c) Joint programs for disposal of hazardous materials to ensure that these materials such as pesticides, contaminated petroleum products, contaminated sludge and dredge spoils and industrial wastes are properly transported and disposed of. Every effort shall be made to implement these programs by 1980.
4. **Monitoring**. Monitoring and research programs in support of the Great Lakes International Surveillance Plan should be established at a level sufficient to identify:
   (a) Temporal and spatial trends in concentration of persistent toxic substances such as PCB, mirex, DDT, mercury and dieldrin, and of there substances known to be present in biota and sediment of the Great Lakes System;
   (b) The impact of persistent toxic substances on the health of humans and the quality and health of living aquatic systems;
   (c) The sources of input of persistent toxic substances; and
   (d) The presence of previously unidentified persistent toxic substances.
5. **Early Warning System**. An early warning system consisting of, but not restricted to, the following elements shall be established to anticipate future toxic substances problems:
   (a) Development and use of structure-activity correlations to predict environmental

characteristics of chemicals;

(b) Compilation and review of trends in the production, import, and use of chemicals;

(c) Review of the results of environmental testing on new chemicals;

(d) Toxicological research on chemicals, and review of research conducted in other countries;

(e) Maintenance of a biological tissue bank and sediment to permit retroactive analysis to establish trends over time;

(f) Monitoring to characterize the presence and significance of chemical residues in the environment;

(g) Development and use of mathematical models to predict consequences of various loading rates of different chemicals;

(h) Development of a data bank for storage of information on physical/chemical properties, toxicology, use and quantities in commerce of known and suspected persistent toxic substances;

(i) *Development of data necessary to evaluate the loadings of critical pollutants or other polluting substances identified in the boundary waters of the Great Lakes System; and*

(j) *Further development and use of reproduction, physiological and biochemical measures in wildlife, fish and humans as health effects indicators and the establishment of a data base for storage, retrieval and interpretation of the data.*

6. **Human Health**. The Parties shall establish action levels to protect human health *based on multimedia exposure and the* interactive effects of toxic substances.

7. **Research**. Research should be intensified to determine the pathways, fate and effects of toxic substances aimed at the protection of human health, fishery resources and wildlife of the Great Lakes Basin Ecosystem. In particular, research should be conducted to determine:

   (a) The significance of effects of persistent toxic substances on human health and aquatic life;

   (b) Interactive effects of residues of toxic substances on aquatic life, wildlife, and human health; and

   (c) Approaches to calculation of acceptable loading rates for persistent toxic substances, especially those which,in part, are naturally occurring.

8. ***Reporting***. *The Parties shall report, by December 31, 1988 and biennially thereafter, on the progress of programs and measures to reduce the generation of contaminants in accordance with the principle in sub-paragraph 2 (a) (iii) above.*